IN THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) A method, comprising:

decomposing a signal comprising a plurality of process variable measurements into a plurality of decomposed signals at a plurality of resolution levels, the process variable measurements associated with operation of a valve;

grouping the decomposed signals into a plurality of groups, each group comprising decomposed signals at multiple resolution levels; [[and]]

identifying one or more defect indicators for at least some of the resolution levels using the groups; and [[,]]

using the one or more defect indicators ~~associated with~~ to identify a possible defect in the valve;

wherein identifying the one or more defect indicators for ~~at least some~~ one of the resolution levels comprises ~~, for each of the groups,~~ using relationships between the decomposed signals in ~~that~~ one of the groups to identify one or more defect indicators at one of the resolution levels.

2. (Previously Presented) The method of Claim 1, wherein:

decomposing the signal comprises performing wavelet decomposition to generate wavelet coefficients at each of the resolution levels;

grouping the decomposed signals comprises grouping the wavelet coefficients at multiple resolution levels into groups of wavelet coefficients; and

identifying the one or more defect indicators comprises performing singularity detection using the groups of wavelet coefficients.

3. (Original) The method of Claim 1, wherein the process variable measurements comprise measurements of a flow rate of one or more materials flowing through the valve.

4. (Original) The method of Claim 1, wherein the one or more defect indicators identify one or more jumps in the process variable measurements.

5. (Original) The method of Claim 4, wherein the one or more jumps represent one or more deterministic signal changes where the process variable measurements change by a threshold amount within a given time period.

6. (Currently Amended) The method of Claim 1, wherein using the one or more defect indicators to identify the possible defect in the valve comprises: ~~further comprising:~~

selecting one of the resolution levels; and

determining a probability of a valve defect based on the defect indicators at the selected resolution level.

7. (Previously Presented) The method of Claim 1, wherein grouping the decomposed signals into the plurality of groups comprises grouping the decomposed signals from three adjacent resolution levels into each group, the groups forming overlapping groups where at least some of the decomposed signals form part of two or more groups.

8. (Currently Amended) An apparatus, comprising:

one or more processors collectively operable to:

decompose a signal comprising a plurality of process variable measurements into a plurality of decomposed signals at a plurality of resolution levels, the process variable measurements associated with operation of a valve;

group the decomposed signals into a plurality of groups, each group comprising decomposed signals at multiple resolution levels; [[and]]

identify one or more defect indicators for at least some of the resolution levels using the groups, ~~the one or more defect indicators associated with a possible defect in the valve,~~ wherein the one or more defect indicators at one of the resolution levels are identified using relationships between the decomposed signals in one of the groups; and

use the one or more defect indicators to identify a possible defect in the valve; and

a memory operable to store the one or more defect indicators.

9. (Previously Presented) The apparatus of Claim 8, wherein:

the one or more processors are collectively operable to decompose the signal by performing wavelet decomposition to generate wavelet coefficients at each of the resolution levels;

the one or more processors are collectively operable to group the decomposed signals by grouping the wavelet coefficients at multiple resolution levels into groups of wavelet coefficients; and

the one or more processors are collectively operable to identify the one or more defect indicators by performing singularity detection using the groups of wavelet coefficients.

10. (Original) The apparatus of Claim 8, wherein the process variable measurements comprise measurements of a flow rate of one or more materials flowing through the valve.

11. (Original) The apparatus of Claim 8, wherein the one or more defect indicators identify one or more jumps in the process variable measurements.

12. (Currently Amended) The apparatus of Claim 8, wherein the one or more processors are ~~further~~ collectively operable to use the one or more defect indicators to identify the possible defect in the valve by:

selecting one of the resolution levels; and

determining [[e]] a probability of a valve defect based on the defect indicators at the selected resolution level.

13. (Original) The apparatus of Claim 8, wherein the one or more processors are further collectively operable to generate a second signal and supply the second signal to a valve adjuster, the valve adjuster operable to use the second signal to adjust an opening of the valve.

14. (Previously Presented) The apparatus of Claim 8, wherein the one or more processors are collectively operable to group the decomposed signals into the plurality of groups by grouping the decomposed signals from three adjacent resolution levels into each group, the groups forming overlapping groups where at least some of the decomposed signals form part of two or more groups.

15. (Currently Amended) A computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code for:

decomposing a signal comprising a plurality of process variable measurements into a plurality of decomposed signals at a plurality of resolution levels, the process variable measurements associated with operation of a valve;

grouping the decomposed signals into a plurality of groups, each group comprising decomposed signals at multiple resolution levels; and

identifying one or more defect indicators for at least some of the resolution levels using the groups; and [[,]]

using the one or more defect indicators ~~associated with~~ to identify a possible defect in the valve; [[,]]

wherein the one or more defect indicators at one of the resolution levels are identified using relationships between the decomposed signals in one of the groups.

16. (Previously Presented) The computer program of Claim 15, wherein:

the computer readable program code for decomposing the signal comprises computer readable program code for performing wavelet decomposition to generate wavelet coefficients at each of the resolution levels;

the computer readable program code for grouping the decomposed signals comprises computer readable program code for grouping the wavelet coefficients at multiple resolution levels into groups of wavelet coefficients; and

the computer readable program code for identifying the one or more defect indicators comprises computer readable program code for performing singularity detection using the groups of wavelet coefficients.

17. (Original) The computer program of Claim 15, wherein the process variable measurements comprise measurements of a flow rate of one or more materials flowing through the valve.

18. (Original) The computer program of Claim 15, wherein the one or more defect indicators identify one or more jumps in the process variable measurements.

19. (Currently Amended) The computer program of Claim 15, ~~further comprising~~ wherein the computer readable program code for using the one or more defect indicators to identify the possible defect in the valve comprises computer readable program code for:

selecting one of the resolution levels; and

determining a probability of a valve defect based on the defect indicators at the selected resolution level.

20. (Original) The computer program of Claim 15, further comprising computer readable program code for generating a second signal and supplying the second signal to a valve adjuster, the valve adjuster operable to use the second signal to adjust an opening of the valve.

21. (Currently Amended) A system, comprising:

a valve;

a measuring device operable to generate a signal comprising measurements of a process variable associated with operation of the valve;

a controller operable to generate output values for adjusting the valve based on the process variable measurements; and

a defect detector operable to:

decompose the signal into a plurality of decomposed signals at a plurality of resolution levels;

group the decomposed signals into a plurality of groups, each group comprising decomposed signals at multiple resolution levels; [[and]]

identify one or more defect indicators for at least some of the resolution levels using the groups; and [[,]]

using the one or more defect indicators ~~associated with~~ to identify a possible defect in the valve; [[,]]

wherein the one or more defect indicators at one of the resolution levels are identified using relationships between the decomposed signals in one of the groups.

22. (Original) The system of Claim 21, wherein the defect detector forms part of the controller.

23. (New) The method of Claim 1, wherein identifying the one or more defect indicators comprises, for each of the groups, using relationships between the decomposed signals in that group to identify one or more defect indicators for that group, the one or more defect indicators for each group associated with a different one of the resolution levels.